# The Impact of America's Climate Security Act of 2007 (S. 2191) on the U.S. Economy and on Global Greenhouse Gas Emissions

By

Margo Thorning, Ph.D.
Senior Vice President and Chief Economist
American Council for Capital Formation
Before the
Committee on Environment and Public Works
U.S. Senate
November 8, 2007

#### Introduction

Madam Chairman and members of the Senate Committee on Environment and Public Works, my name is Margo Thorning, senior vice president and chief economist, American Council for Capital Formation (ACCF)\*, Washington, D.C. I am pleased to present this testimony to the Committee.

The American Council for Capital Formation represents a broad cross-section of the American business community, including the manufacturing and financial sectors, Fortune 500 companies and smaller firms, investors, and associations from all sectors of the economy. Our distinguished board of directors includes cabinet members of prior Republican and Democratic administrations, former members of Congress, prominent business leaders, and public finance and environmental policy experts. The ACCF is celebrating over 30 years of leadership in advocating tax, regulatory, environmental, and trade policies to increase U.S. economic growth and environmental quality.

Senators Lieberman and Warner and the members of the Senate Environment and Public Works Committee are to be commended for their efforts to reduce greenhouse gas emissions so as to mitigate the threat of human-induced climate change. The questions we need to ask are first, what challenges will The America's Climate Security Act of 2007 (S. 2191) pose for the U.S. economy and second, what type of GHG reduction policies should the U.S and other countries adopt to minimize the impacts on economic growth and maximize the benefits to the environment? Greenhouse gas reduction policies should not be undertaken without considering their impacts on energy security, economic growth, and U.S. competitiveness. My testimony will address these key issues.

<sup>\*</sup> The mission of the American Council for Capital Formation is to promote economic growth through sound tax, environmental, and trade policies. For more information about the Council or for copies of this testimony, please contact the ACCF, 1750 K Street, N.W., Suite 400, Washington, D.C. 20006-2302; telephone: 202.293.5811; fax: 202.785.8165; e-mail: <a href="mailto:info@accf.org">info@accf.org</a>; website: www.accf.org

### The America's Climate Security Act of 2007 (S. 2191)

The goal of The America's Climate Security Act of 2007 (S. 2191) is to substantially reduce U.S. greenhouse gas emissions (GHGs) over the 2012-2050 period. The Act covers electric power, transportation, and manufacturing sources, which account for 75 percent of U.S. emissions. The cap requires reducing emissions to 2005 levels by 2012 and then lowers emissions at a constant rate, reaching 1990 levels by 2020 and then a target of 65 percent below 1990 levels by 2050. The Act also strengthens energy efficiency standards for appliances and buildings in order to address commercial and residential sector emissions not covered by the emission reduction targets.

# • U.S. Projected Growth in Emissions and Population: Effect on Achievement of S. 2191 Targets

## **Emissions Growth**

A major stumbling block to the U.S.'s meeting the S. 2191 targets is projected increases in covered emissions (emissions included in the bill) and population over the next several decades. According to estimates by the U.S. Department of Energy's Energy Information Administration, covered emissions under the baseline forecast ("baseline" means no new mandatory carbon emission reduction programs) grow by 30 percent from 2012 to 2030. The baseline forecast already includes assumptions about increased energy efficiency but, even so, covered GHG emissions are projected to rise to 6,613 million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub>e) by 2020, compared to the S. 2191's required reduction to 4,432 MMTCO<sub>2</sub>e. Sharp cutbacks in U.S. energy use would be necessary to close the 33 percent gap (2,181 /MMTCO<sub>2</sub>e) in 2020 between projected emissions and the S. 2191 target. By 2030, the gap between the baseline forecast and the S. 2191 target rises to 55 percent or 4,311 MMTCO<sub>2</sub>e (see Figure 1).

### **Per Capita Emissions**

The projected increase in U.S. population, from 308 million residents in 2010 to 335 million residents in 2020 and 363 million in 2030, will make GHG emission reductions very challenging, since more people means more energy is needed for home heating and cooling, job growth and transportation (see Figure 2). To illustrate the difficulty of reducing U.S. emissions to S. 2191 levels, consider that over the decade between 1990-2000 period, per capita emissions in the U.S. fell by only 0.8 percent and they are projected to decline by a total of only 0.6 percent from 2000 to 2012 (see Table 1). EIA's forecast projects increases in per capita covered emissions between 2012 and 2030 (see Table 1).

<sup>&</sup>lt;sup>1</sup> "Energy Market and Economic Impacts of S.280, the Climate Stewardship and Innovation Act of 2007". U.S. Department of Energy, Energy Information Administration, August 2007 and ACCF calculations using S.2191 targets.

**Covered GHG Emissions** Million Metric Tons CO2 Equivalent Gap in 2030: 4,311 MMtCO2e S. 2191 Emissions Target 

Figure 1. Greenhouse Gas Emissions: Under EIA Baseline Forecast and S. 2191 Targets (Million Metric Tons CO2 Equivalent)

**Source**: "Energy Market and Economic Impacts of S.280, the Climate Stewardship and Innovation Act of 2007". U.S. Department of Energy, Energy Information Administration, August 2007 and ACCF calculations.

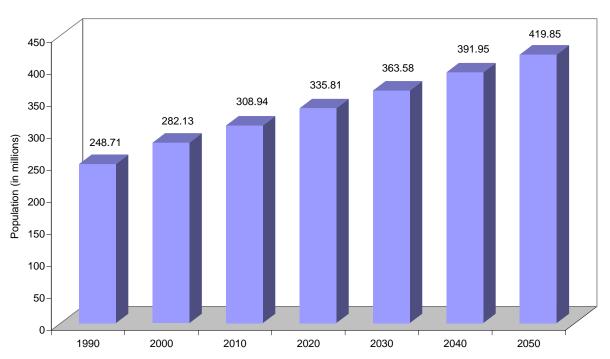


Figure 2. U.S. Population Projected to Increase

<u>Source</u>: U.S. Census Bureau, 2004, "U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin," http://www.census.gov/ipc/www/usinterimproj/

Table 1. U.S. Per Capita Covered GHG Emissions under Baseline Forecast and Decrease  Required for S. 2191 Targets							
	Historical and Baseline Emission				S. 2191 Targets		
Year	Emissions (MMTCO2E)	Population (Millions)	Per Capita GHG Emissions	Percent Change	S. 2191 Targets	Required Per Capita GHG Emissions	Per Capita Percent Change in Emissions
1990	4,810.15	248.71	19.34				
2000	5,413.78	282.13	19.19	-0.8%	5414	19.19	
2012	5,995.47	314.28	19.08	-0.6%	5,200	16.55	-13.8%
2020	6,613.74	335.81	19.70	3.2%	4,432	13.20	-20.2%
2030	7,783.32	363.58	21.41	8.7%	3,472	9.55	-27.6%
			2000-2030 2012-2030	11.6% 12.2%			-50.2% -42.3%

**Note**: Baseline is for covered emissions.

**Source**: Source for historical and baseline Emission forecast is "Energy Market and Economic Impacts of S.280, the Climate Stewardship and Innovation Act of 2007". U.S. Department of Energy, Energy Information Administration, August 2007 and ACCF calculations using S.2191 targets.

In order to meet the emission reduction targets in S. 2191, U.S. per capita emissions would have to fall by a total of 13.8 percent over the 2000-2012 period, an additional 20.2 percent from 2012 to 2020 and a further 27.6 from 2020 to 2030 (see Table 1). In other words, the required reductions in per capita emissions are about 25 to 35 times greater than what occurred from 1990 to 2000. The technologies simply do not exist to reduce total (and per capita emissions) over the next 17 years by the amounts mandated in S. 2191—to say nothing of the time and expense required to replace existing energy-using equipment—without severely reducing the growth in the U.S. economy and in employment. The analysis above tends to corroborate Senator Lieberman's recent statement that S.2191 would cost "hundreds of billions" of dollars over the next few decades. Previous macroeconomic analyses of emission reduction targets similar to those of S. 2191 have concluded that the required cuts in U.S. energy use would reduce GDP levels by 1.5 to 2.5 percent annually and result in significant net job loss.

# Pros and Cons of Mandatory Greenhouse Gas Emission Reduction Programs: Cap and Trade versus a Carbon Tax

As policymakers deliberate the imposition of mandatory approaches to reducing U.S. GHG emissions, it is helpful to evaluate the strengths and weaknesses of the two prominent strategies: a cap and trade system and a carbon tax. A cap and trade system puts an absolute restriction on the quantity of emissions allowed (i.e., the cap) and allows the price of emissions to adjust to the marginal abatement cost (i.e., the cost of controlling a unit of emissions). A carbon tax, in contrast, sets a price for a ton of emissions and allows the quantity of emissions to adjust to the level at which marginal abatement cost is equal to the level of the tax.

In a recent paper, Ian Perry of Resources for the Future notes that as a result of the success of the U.S. sulfur dioxide trading program and the start up of the European Union's Emission Trading System, many in Congress have expressed support for a cap and trade system in the U.S. Perry cautions, however, that other options, such as tax on carbon emissions, may be a superior instrument if a mandatory federal carbon emission program were to be established (Weathervane, March 23, 2007).

### • Cap and trade system and carbon price volatility

Price volatility for a permit to emit CO<sub>2</sub> can arise under a cap and trade program because the supply of permits is fixed by the government, but the demand for permits may vary considerably year to year with changes in fuel prices and the demand for energy. As mentioned above, price volatility for energy has negative impacts on economic growth. In contrast, a CO<sub>2</sub> tax fixes the price of CO<sub>2</sub>, allowing the amount of emissions to vary with prevailing economic conditions.

For example, in the EU the price of a permit to emit a ton of carbon has varied by 17.5 percent per month over the first 22 months' operation of the ETS. As a new study by Dr. Michael Canes, senior research fellow at LMI, points out, volatility in fossil energy prices have strong adverse impacts on U.S. economic growth. Even a reduction in the rate of growth from such a shock of as little as 0.1 percent per year implies costs of over \$13

billion per year. (Why a Cap & Trade is the Wrong Policy to Curb Greenhouse Gases for the United States, The Marshall Institute, July, 2007).

In addition, studies have shown that a cap and trade program that gives away (rather than auctioning the permits) can be highly inequitable; the reason is that firms receiving allowances reap windfall profits, which ultimately accrue to individual stockholders, who are concentrated in relatively high-income group.

### Cap and trade system and flexibility in timing of reductions

Many experts conclude that it makes economic sense to allow nationwide emissions to vary on a year-to-year basis because prevailing economic conditions affect the costs of emissions abatement. This flexibility occurs under a CO<sub>2</sub> tax because firms can choose to abate less and pay more tax in periods when abatement costs are unusually high, and vice versa in periods when abatement costs are low. Traditional permit systems do not provide similar flexibility because the cap on economy wide emissions has to be met, whatever the prevailing abatement cost.

#### Cap and trade system: impact on consumers and workers

Regardless of how the allowances were distributed (unless they were all auctioned and the proceeds rebated to low income households), most of the cost of meeting a cap on CO<sub>2</sub> emissions would be borne by consumers, who would face persistently higher prices for products such as electricity and gasoline. Those price increases would be regressive in that poorer households would bear a larger burden relative to their income than wealthier households would. In addition, workers and investors in parts of the energy sector—such as the coal industry—and in various energy-intensive industries would be likely to experience losses as the economy adjusted to the emission cap and production of those industries' goods declined. (Congressional Budge Office, Economic and Budget Issue Brief, April 25, 2007.) In contrast, carbon tax revenues could be rebated to low income individuals to offset the impact of higher energy prices caused by the tax on fossil fuels.

#### • Impact of a cap and trade system on innovation

Caps on emissions are not likely to promote new technology development because caps will force industry to divert resources to near-term, "end of pipe" solutions rather than promote spending for long-term technology innovations that will enable us to reduce GHGs and increase energy efficiency. An emission trading system will send exactly the wrong signals to investors because it will create uncertainty about the return on new investment. A "safety-valve" price of carbon (designed to create a sense of confidence about future energy costs) can easily be changed. Such uncertainty means that the hurdle rate, which new investments must meet, will be higher (thus less investment will occur) and they will be less willing to invest in the U.S. A tax on carbon would provide more certainty for investors and allow them to replace old capital equipment with less carbon intensive equipment during the replacement cycle.

# • Impact of a U.S. cap and trade system on global GHG emission growth

Finally, caps on U.S. emission growth are unlikely to succeed unless all the relevant markets exist (in both developed and developing countries) and operate effectively. All the important actions by the private sector have to be motivated by price expectations far in the future. Creating that motivation requires that emission trading establish not only current but future prices, and create a confident expectation that those prices will be high enough to justify the current R&D and investment expenditures required to make a difference. Motivating new investment requires that clear, enforceable property rights in emissions be defined far into the future so that emission rates for 2030, for example, can be traded today in confidence that they will be valid and enforceable on that future date. The EU's experience over the last two years, with the price of CO<sub>2</sub> emission credits fluctuating between 1 and 30 euros per ton of CO<sub>2</sub>, does not inspire confidence in companies having to make investment decisions. The international framework for climate policy that has been created under the UNFCCC and the Kyoto Protocol cannot create that confidence for investors because sovereign nations have different needs and values.

# • Carbon taxes: potential drawbacks

A carbon tax, as a system of inducing emissions reductions, is not without drawbacks. First, revenues from a  $CO_2$  tax (or auctioned permits) might end up being wasted; for example, if the revenue went toward special interests, rather than substituting for other taxes. Second, progress on emissions reductions is uncertain under a  $CO_2$  tax because emissions vary from year to year with economic conditions.

### What Can We Learn from the European Union's Emission Trading System?

As we attempt to choose the right path for a U.S. GHG emission reduction strategy, it is useful to examine the cost-effectiveness of current policies to reduce GHG emissions in developed countries. In the European Union, reduction of GHGs has become a major policy goal and billions of euros, from both the private and the public sector, have been spent on this policy objective. Many policymakers, the media and the public believe that the European Union's Emission Trading System (ETS) has produced reductions in GHG emissions and that their system could serve as a model for the U.S. The ETS, created in 2005, is a market-based, EU-wide system that allows countries to "trade" (i.e., buy and sell) permits to emit CO<sub>2</sub>. The ETS covers about 11,500 installations and almost half of the EU's GHG emissions.

The EU 15 (the major industrial countries) have a Kyoto Protocol target of an 8 percent reduction below 1990 levels in GHGs by 2010-2012. The European Environmental Agency's latest projections (October 2006) show that without strong new measures, EU 15 emissions will be 7.4 percent above 1990 levels in 2010, rather than 8 percent below as required by the Kyoto Protocol (see Figure 3). Further evidence of the challenge the EU faces in meeting its Kyoto Targets is found in a recent report by the European Commission showing that electricity consumption continues to rise. Over the 1999-2004 period, residential and commercial electricity consumption increased by 10.8 percent and industrial electricity use rose by 6.6

percent in spite of numerous incentives to increase EU energy efficiency (*Electricity Consumption and Efficiency Trends in the Enlarged European Union*, Joint Research Centre, European Commission, July, 2007).

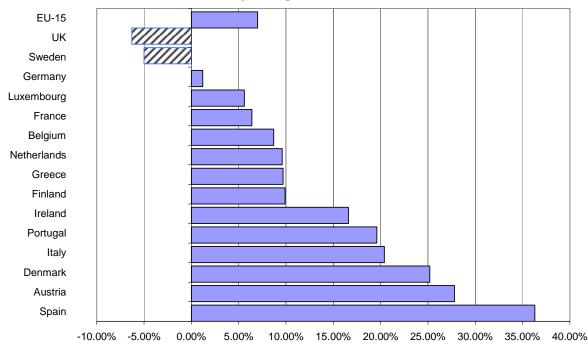


Figure 3: Greenhouse Gas Emissions in the European Union Projected to Exceed Kyoto Targets in 2010

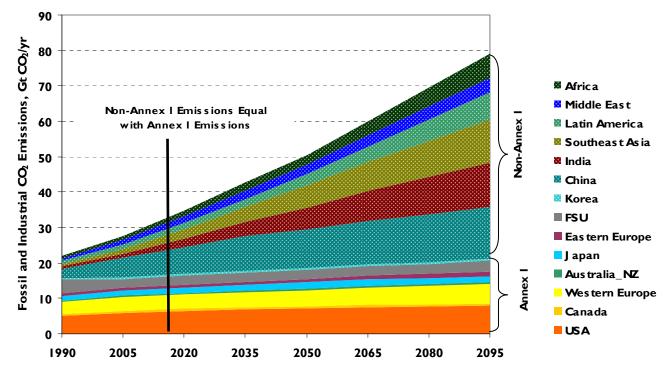
Source: European Environmental Agency, October 2006

The fact that the European Environmental Agency projects that the EU 15 will be 7 percent above 1990 levels of emissions in 2010 (instead of 8 percent below) demonstrates that the mandatory ETS system as currently structured is not providing the desired results and that much stronger measures will be required to meet the Kyoto Protocol target as well as the new post-2012 target. In addition, the EU's new report "The Fourth Assessment" (October 10, 2007) observes that "a further reduction of 7.1 percent or 303 million tonnes of CO<sub>2</sub> equivalent is needed to meet the Kyoto target" and that further domestic policies and measures will have to be implemented. Implementing even tighter emission targets or higher energy taxes in the EU is likely to be politically difficult.

#### Strategies to Reduce Global and U.S. GHG Emission Growth

Slowing the growth of global GHG emissions will depend on factors such as increased energy efficiency, technology developments in both fossil fuels (carbon capture and storage, for example) and renewable fuels (wind and solar, in particular) and, most likely, on increased reliance on nuclear power for electricity generation. In addition to reducing GHG growth in the developed countries, it will be necessary to increase energy efficiency and reduce the growth of greenhouse gas emissions in the developing world since that is where the strong growth in

emissions is coming from (**see Figure 4**). Making progress on these objectives will require a significant commitment of resources, much of which will need to come from the private sector.



**Figure 4. World Carbon Dioxide Emissions** 

**Source**: Data derived from Global Energy Technology Strategy, Addressing Climate Change: Phase 2 Findings from an International Public-Private Sponsored Research Program, Battelle Memorial Institute, 2007.

Technology development and deployment offers the most efficient and effective way to reduce GHG emissions and a strong economy tends to pull through capital investment faster. There are only two ways to reduce CO<sub>2</sub> emissions from fossil fuel use - use less fossil fuel or develop technologies to use energy more efficiently to capture emissions or to substitute for fossil energy. There is an abundance of economic literature demonstrating the relationship between energy use and economic growth, as well as the negative impacts of curtailing energy use. Over the long-term, new technologies offer the most promise for affecting GHG emission rates and atmospheric concentration levels.

# • The role of international partnerships in promoting institutional change and favorable investment climate in developing countries

Research by Drs. David Montgomery and Sugandha Tuladhar of CRA International makes the case that agreements such as the Asia-Pacific Partnership on Clean Development and Climate (AP6), an agreement signed in 2005 by India, China, South Korea, Japan, Australia and the United States, offers an approach to climate change policy that can reconcile the objectives of economic growth and environmental improvement for developing countries. (See <a href="www.iccfglobal.org">www.iccfglobal.org</a> for the full paper.) Together, the AP6 partners have 45 percent of the world's population and emit 50 percent

of man-made CO<sub>2</sub> emissions. The projections of very strong growth in greenhouse gases in developing countries over the next 20 years mean that there is enormous potential for reducing emissions through market-based mechanisms for technology transfer.

Drs. Montgomery and Tuladhar note that there are several critical factors for ensuring the success of an international agreement which relies strongly on private sector investment for success. Their research shows that institutional reform is a critical issue for the AP6 because the lack of a market-oriented investment climate is a principal obstacle to reducing greenhouse gas emissions in China, India and other Asian economies. China and India have both started the process of creating market-based economic systems, with clear benefits in the form of increased rates of economic growth. But the reform process has been slow and halting, leaving in place substantial institutional barriers to technological change, productivity growth, and improvements in emissions. The World Bank and other institutions have carried out extensive investigations about the role of specific institutions in creating a positive investment climate. These include minimizing corruption and regulatory burdens, establishing an effective rule of law, recognition of intellectual property rights, reducing the role of government in the economy, removing energy price distortions, providing an adequate infrastructure and an educated and motivated labor force.

#### • Importance of technology transfer for emission reductions

As described above, technology is critically important because emissions per dollar of income are far larger in developing countries than in the United States or other industrial countries. This is both a challenge and an opportunity. It is a challenge because it is the high emissions intensity – and relatively slow or non-existent improvement in emissions intensity – that is behind the high rate of growth in developing country emissions.

Opportunities exist because the technology of energy use in developing countries embodies far higher emissions per dollar of output than does technology used in the United States; this is true of new investment in countries like China and India as well as their installed base (see Figure 5.) The technology embodied in the installed base of capital equipment in China produces emissions at about four times the rate of technology in use in the United States. China's emissions intensity is improving rapidly, but even so its new investment embodies technology with twice the emissions intensity of new investment in the United States. India is making almost no improvement in its emissions intensity, with the installed base and new investment having very similar emissions intensity. India's new investment also embodies technology with twice the emissions intensity of new investment in the United States.

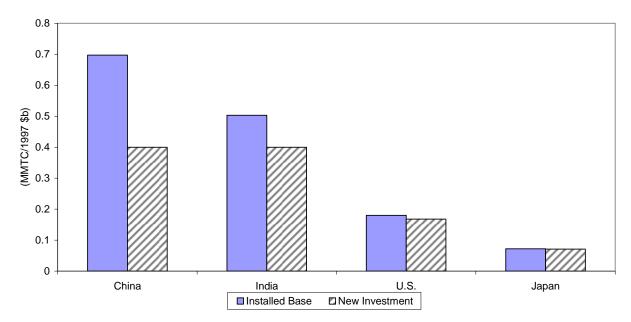


Figure 5. Greenhouse Gas Emissions Associated with Existing and New Investment in 2001
(Million tons of Carbon per \$ Billion of Gross Domestic Product)\*

\* Calculated using Market Exchange Rates

**Source**: "Promoting a Positive Climate for Investment, Economic Growth and Greenhouse Gas Reductions," W. David Montgomery and Sugandha Tuladhar (see <a href="https://www.iccfglobal.org">www.iccfglobal.org</a>)

# • The role of economic growth and technology in GHG reduction

Many policymakers overlook the positive impact that economic growth can have on GHG emission reductions. For example, in 2006, while the U.S. economy grew at 3.3 percent, CO<sub>2</sub> emissions fell to 5,877 MMTCO<sub>2</sub>, down from 5,955 MMTCO<sub>2</sub> in 2005, a 1.3 percent decrease. Overall energy use only declined by 0.9 percent, indicating the U.S economy is becoming less carbon intensive even without mandatory emission caps or carbon taxes.

Internationally, the U.S. compares well in terms of reducing its energy intensity (the amount of energy used to produce a dollar of output). The U.S., with its voluntary approach to emission reductions, has cut its energy intensity by 20 percent over the 1992-2004 period compared to only 11.5 percent in the EU with its mandatory approach (see Figure 6). Strong U.S. economic growth, which averaged over 3 percent per year from 1992 to 2005 compared to about 1 percent in the EU, is responsible for the U.S.'s more rapid reduction in energy intensity in recent years.

#### Accelerating U.S. energy efficiency and GHG reductions

The development of various high technology programs and new energy efficient investments can be accelerated through government programs as well as by reforms to the federal tax. For example, some policies may be of particular help to taxable entities

while others would be of more benefit to cooperatives (which pay little or no federal income tax).

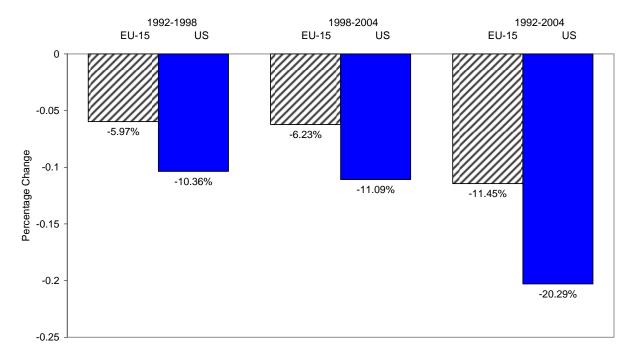


Figure 6. Comparison of European Union and U.S. Energy Intensity Reduction, 1992-2004

**Source**: EIA, International Energy Annual 2007. (Percentage Changes are calculated using Total Primary Energy Consumption per Dollar of Gross Domestic Product.)

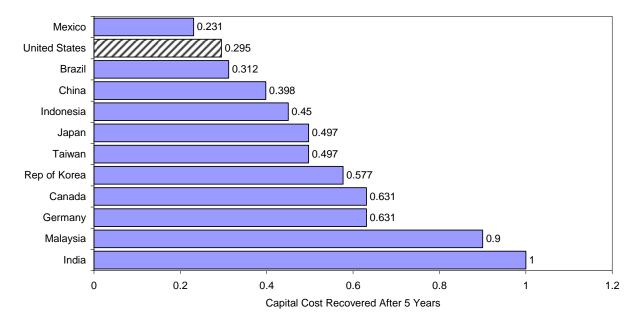
#### Companies subject to the federal income tax

The efforts of U.S. industries to increase energy security and efficiency and to reduce growth in GHG emissions are hindered by the slow rate of capital cost recovery allowed under the U.S. federal tax code and by the high U.S. corporate tax rate. As a new Ernst&Young international comparison shows, the U.S. ranks last or nearly last among our trading partners in terms of how quickly a dollar of investment is recovered for many key energy investments. For example, a U.S. company gets only 29.5.cents back after 5 years through depreciation allowances for each dollar invested for a combined heat and power project. In contrast, in China the investor gets 39.8 cents back, in Japan, 49.7 cents, in India, 55.6 cents and in Canada the investor gets 79.6 cents back after 5 years for every dollar invested. Another example is U.S. investment in "smart meters", which can substantially reduce electricity use. U.S. investors only get 29.5 cents back after 5 years, compared to \$1.00 in India and 63.1 cents in Germany (see Figure 7). (See full report at: http://www.accf.org/pdf/Energy-Depreciation-Comparison.pdf.)

In addition to slow capital cost recovery allowances, U.S. industry faces the highest corporate income tax rates among our primary trading partners. Of the 12

countries in the E&Y survey, only Japan had a higher corporate tax rate than the U.S. Reforms to the U.S. tax code to speed up capital cost recovery allowances and reduce the corporate tax rate would reduce the cost of capital and could have a positive impact on energy sector investment, and help "pull through" cleaner, less-emitting technologies.

Figure 7. U.S. Capital Cost Recovery for Smart Meters Compares Poorly with Our Trading Partners (Percent of Nominal Capital Cost Recovered After 5 Years)



<u>Source</u>: "International Comparison of Depreciation Rules and Tax Rates for Selected Energy Investments," prepared for the American Council for Capital Formation by Ernst & Young LLP, May 2007. For full report, please see <a href="www.accf.org">www.accf.org</a>.

#### Non-taxable entities

For non-taxable entities such as electric utility cooperatives, other incentives could be provided to encourage the more rapid adoption of new technologies to reduce GHG emissions. For example, electric cooperatives and their consumers cannot apply or benefit from traditional tax incentives because as not-for-profit utilities, they do not have significant federal income tax liability to offset. However, to ensure that the not-for-profit electric utility sector is able to participate in incentives for advanced low carbon technologies, incentives comparable to those offered to for profit entities can be created. One example is the successful Clean Renewable Energy Bond program that permits electric cooperatives and others to issue bonds that act as interest-free loans for the purpose of building qualified renewable generation. The CREB program can be adapted for other technologies that achieve carbon reduction goals. Grants are another avenue to assist not-for-profits in adopting new technology.

#### **Conclusions**

To be effective, policies to reduce global GHG emission growth must include both developed and developing countries. Polices which enhance technology development and transfer are likely to be more widely accepted than those that require sharp, near term reductions in per capita energy use. Extending the framework of the Asia-Pacific Partnership on Clean Development and Climate to other major emitters will allow developed countries to focus their efforts where they will get the largest return, in terms of emission reductions for the least cost.

Finally, if the United States does adopt a mandatory greenhouse gas emissions reduction program, serious consideration should be given to implementing a carbon tax rather than an EU-style cap and trade system. A key component of any mandatory U.S. program should be allowing emissions to increase as both economic growth and U.S. population increase.